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  Accepted by California Institutions, 1956-1957
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- Analysis of High School G E D Scores
- Achievement in Social and Family Relationships
- Specialists: Employment and Ways of Working
- Shorthand Study and Spelling Abilities

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THE EDITORS SAY:

In this issue the *California Journal of Educational Research* again presents an annual report of doctoral dissertations completed in California schools and colleges of education. The list is impressive. There were 123 dissertations accepted during the 1956-1957 academic year.

As in previous years, the range of topics is great. Some are very broad, and others narrowly specific. Some are theoretical or historical; others directly concerned with practice. Some will please those who believe in research conducted purely for the sake of increasing men's store of knowledge; others will satisfy those that demand that scholarship pay off in immediate changes and improvements in daily work.

It is good to see that all points of view are operating in selecting research problems for doctoral studies in California. When a variety of choices is possible there is always a chance for changing interests and problems in the field to be reflected in college and university activities. This unquestionably tends to reduce the height of ivory towers.

The most notable trend indicated by this year's list of dissertations is a growth in interest in teachers. With eight studies directly bearing on personnel practice and teacher status, and eight others closely related to it, the problems of teachers received more study than ever before in our teacher education institutions. When it is noted that there were also eleven studies in teacher education and professional standards, the implication is even clearer. The *profession* of education is receiving serious consideration in California colleges and universities.

The increased attention to professional problems is relative. There has not been a diminution of interest in other, more technical, aspects of education. There were seventeen studies in theory of education, 24 studies in related sciences, 16 in curriculum, and 16 in guidance and counseling. Many other topics are also well represented in the list.

On the whole, educational research in California at the doctoral level appears to be in a very healthy condition. The only trouble is that many of the problems are far too complex to be dealt with adequately in a single doctoral study. This is particularly true of those dealing with the personnel of the profession. Cooperative research programs, follow-up or companion studies, and—above all—field applications of some of the solutions developed in the doctoral studies, are needed.

So it appears that the obvious success of educational research in California, as exemplified by the list of dissertations published in this issue of the *Journal*, does not solve our problems so that we can relax. Instead it clarifies them so we can work harder to meet the challenges they present. G.G.G.

Response Set Patterns in Published Instructors' Manuals in Education and Psychology

NEWTON S. METFESSEL and GILBERT SAX

The time-honored maxim "know thyself" is inevitably being transformed by today's discerning student to "know thy instructor." The statement "If you want to score high on a subjective test, learn the instructor's biases" is almost a campus cliche which has been accepted by teachers and students alike. But the fact that objective tests can also contain subjective contaminants is not yet widely recognized.

This investigation is a study of a subjective bias found in the keying of correct response alternatives in objective tests: in this case, true-false and multiple choice items found in instructors' manuals used in education and psychology courses. As an example of how this response set bias operates, let us assume that Professor X has a course in general psychology. He decides to adopt Boyer and Hable's *General Psychology* as his text. The publishers of the text also furnish a *Student's Manual for General Psychology*. In this booklet, along with some multiple-choice items, there are 465 true-false items. Professor X decides to use these questions in terms of weekly quizzes to assign grades. But of these 465 true-false items, only 198 are scored "false." The remaining 267 are scored "true." On the basis of chi square, the probability is only one out of a hundred that the difference between the number of true and false items is due to chance factors.

Similarly, one would expect approximately 70 items to occur at each of the four response positions for the 280 multiple-choice items found in the same manual. However, only 47 items were keyed to the first response position, and 82, 67, and 84 were keyed to the second, third and fourth response alternatives, respectively. Here again, the response set bias is significant at the .01 level of significance.

Obviously, such patterning of response alternatives represents contaminating influences for both the validity and reliability of classroom tests based on published instructors' manuals.

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This report represents a study of several of the leading manuals in the field of education and psychology as reported in table I.

TABLE I

Multiple-Choice Response Set Patterns in Published Instructors' Manuals in Education and Psychology

Manual	*Response*					*Chi Square*
	1	*2*	*3*	*4*	*5*	
Boyer and Hable	47	82	67	84	....	10.238**
Garrett	40	40	40	30	....	2.001
Hilgard (1953)	91	112	99	62	....	14.790**
Hilgard (1954)	93	89	90	101	....	.957
Karn and Weitz	37	36	51	48	....	4.045
Morgan	205	204	209	191	....	.902
Morse and Wingo	40	31	46	42	....	3.298
Munn	102	105	91	131	....	8.023*
Patty and Johnson	42	45	46	43	....	.228
Ruch (1953)	81	99	221	145	....	86.718**
Ruja	77	99	116	112	....	9.166*
Stagner and Karwoski	4	27	17	23	12	32.475**
Stagner and Karwoski (suppl.)	29	66	36	27	....	25.069**

* Significant at .05 level of significance.
** Significant at .01 level of significance.

An examination of Tables I and II would seem to indicate that in over half of the published instructors' manuals picked at random for inclusion in this study, a response set bias is in evidence. A sophisticated

TABLE II

True-False Response Set Patterns in Published Instructors' Manuals in Education and Psychology

Manual	*Response*		*Chi Square*
	True	*False*	
Boyer and Hable	267	198	10.238**
Garrett	75	75	0.000
Hurlock	310	439	22.212**
Karn and Weitz	93	272	87.776**
Morse and Wingo	253	289	2.390
Patty and Johnson	260	215	4.262*

* Significant at .05 level of significance.
** Significant at .01 level of significance.

student could, by examining the patterning of correct responses in the first few chapters in a series of tests taken from some of the published manuals, increase his score significantly. Teachers and professional test constructors

should become aware of their response set biases in order to reduce subjective contaminants from lowering the reliability and validity of test scores.

Summary

Randomly selected instructors' manuals for use in education and psychology courses were analyzed in terms of their response set biases. Chi squares were computed and presented for multiple-choice and true-false items. In over half of the manuals examined, a significant response set bias was found.

BIBLIOGRAPHY

Berg, Irwin A. "The Reliability of Extreme Position Response Sets on Two Tests," *Journal of Psychology*, XXXVI (1953), 3-9.

Carroll, J. B. "The Effect of Difficulty and Chance Success on Correlations Between Items or Between Tests," *Psychometrika*, X (1945), 1-19.

Cronbach, L. J. "Studies of Acquiescence as a Factor in the True-False Test," *Journal of Educational Psychology*, XXXIII (1942), 401-15.

——— "Response Sets and Test Validity," *Educational and Psychological Measurement*, VI (1946), 475-94.

——— "Further Evidence on Response Sets and Test Design," *Educational and Psychological Measurement*, X (1950), 3-31.

Gilmour, W. A. and Gray, D. E. "Guessing on True-False Tests," *Educational Research Bulletin*, XXI (1942), 9-12.

Goodfellow, Louis D. "The Human Element in Probability," *Journal of General Psychology*, XXIII (1940), 201.

Gordon, L. V. "Validities of the Forced-Choice and Questionnaire Methods of Personality Measurement," *Journal of Applied Psychology*, XXXV (1951), 407-12.

Wherry, R. J. and Gaylord, R. H. "Factor Pattern of Test Items and Tests as a Function of the Correlation Coefficient," *Psychometrika*, IX (1944), 237-44.

Zuckerman, J. V. "A Note on Interest Item Response Arrangement," *Journal of Applied Psychology*, XXXVII (April, 1953), 94-5.

California Institutions Accredited for Teacher Education by State, Regional, and National Agencies is the title of Bulletin Number 7 of the Commission on Teacher Education of the California Teachers Association. This publication contains a complete list of institutions authorized by the State Department of Education to recommend candidates for credentials. The degrees and credentials each institution is authorized to grant are listed. The accreditation of each is also shown, together with the names of the administrative heads of the education departments and of the institutions as a whole. Those interested should request a copy from the Secretary to the Commission at CTA Headquarters, 603 Sutter Street, San Francisco 2, California.

Relationships Among Tests of Intelligence, Vocational Interest and Aptitude

WILLIAM H. LUCIO and FRANK RISCH

A question frequently asked, but not easily answered is, "What function other than determining the intellectual level of an individual can an intelligence test serve in counseling men seeking vocational advice?" The purpose of this study was an endeavor to find an answer to this question and, further, in a limited way, to determine the relationships between performance on intelligence tests and vocational interest and aptitude tests.

Numerous studies have been concerned with problems in this area with many conflicting reports in evidence. The early investigation of Fryer (6) showed the relation of interest to intelligence to be neglible. Berdie (2), in his study, compared two groups: one favorably inclined toward engineering and the other with no measurable interest in that field. His results indicated that the engineering preference group scored higher (significant at the 5% level) on the intelligence test than did the group not favorably disposed to engineering. Several studies (4, 5, 10) designed to investigate the relation between scores on the Strong Vocational Interest Blank and intelligence tests gave findings of negative to slightly positive correlations. Practically all the studies used the verbalized type of intelligence test to determine the relationship of intelligence to interest. An attempt was made in the present study to show that this approach had certain shortcomings and did not explore fully the relations between factors of intelligence and interest. That there is a need for continued study has

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This article is based upon work done for the United States Air Force about 1950.

been emphasized by Berdie (3) and Guertin, Frank, and Rabin (7) in their summaries of research in the field.

Method of Present Study

The selection of the Army Individual Test (AIT) for this investigation was made because of the ease with which verbal and non-verbal components of intelligence on this test could be correlated against literary and mechanical interests. Vocational interests fall into several categories which may or may not be readily associated with both verbal and performance intelligence. The use of a total intelligence test score or the use of a verbal type intelligence test does not lend itself to discriminating certain categories of interest for the reason that special interests may be more closely allied to certain intelligence components (verbal or performance) than to a general intellectual factor, especially when that general capacity is measured by an intelligence scale dominated by verbal material. Thus, one may take as hypotheses, that: (1) if a man indicates predominance of interest in the mechanical field such interest should be reflected in the performance part of an intelligence battery and should have zero or perhaps negative relation to verbal ability; and (2) if a man shows primary interest in, say literary pursuits, such a characteristic should be reflected in the verbal measure of the test.

The present study takes into consideration the hypotheses just mentioned and contrasts vocational interests with both verbal and performance components of intelligence. The Kuder Preference Record (8) was used as the indicator of the particular interest under study. Of the nine specified occupational interests measured by the Kuder Preference Record, two were selected in the present study for analysis. The selection was made on the basis of dissimilarity of one to the other. Literary interest and mechanical interest were assumed to have little or no communality. Each interest was correlated against both verbal and performance intelligence as measured by the AIT.

The population investigated consisted of 104 subjects (officers and enlisted men) who were tested as they came through an Air Forces Counseling Center, seeking vocational and educational advice. As a whole, the group was of superior mental endowment, the mean AIT score of the group being 125 which is equivalent to an AGCT grade II[1].

[1]The Army General Classification Test scores fall into five groups: Approximately 7% of the total population falls in Group I (highest); 24% in Group II; 38% in Group III; 24% in Group IV, and 7% in Group V (lowest). Data from: War Department Technical Manual No. 12-260, Washington, 31 December 1942, page 46.

The correlations between the two types of vocational interests and the two components of intelligence are presented in table I.

TABLE I
Correlation Between AIT Verbal and Performance Scores and Kuder Mechanical and Literary Interest Scores
(N = 104)

Correlation Between —	*r*	*P.E. (est.)*	*Level of Significance*
AIT Verbal and Kuder Mechanical Interest	−.096	.067	None
AIT Verbal and Kuder Literary Interest	.238	.063	1%
AIT Performance and Kuder Mechanical Interest	.273	.061	1%
AIT Performance and Kuder Literary Interest	−.064	.067	None

It is apparent from an inspection of these data that the relationship is positive and that there is a common factor associating performance intelligence with mechanical interest. A correlation of .27 between AIT Performance and Kuder Mechanical, though not high, indicates a positive relationship, especially when the correlation of performance intelligence to literary interest is contrasted.

It was not expected that large positive correlations between vocational interests and intelligence components would be found. Interest is more directly related to non-intellective factors and contains properties dissociate from intelligence. Yet when a strong preference for a certain type of work was expressed, ability was reflected in certain components of intelligence. The need for separation of intelligence into verbal and performance spheres became evident espcially when only a negligible correlation between the total intelligence score (verbal and performance combined) and mechanical or literary preference could be discerned. This assumption became all the more enhanced when it was found that AIT total score correlated .09 with mechanical and .07 with literary interest as shown in table II.

TABLE II
Correlations Between AIT Total Scores and Kuder Mechanical and Literary Interest Scores
(N = 104)

Correlation Between —	*r*	*P.E. (est.)*
AIT Total Score and Kuder Mechanical Interest	.089	.067
AIT Total Score and Kuder Literary Interest	.066	.067

To substantiate such findings and not rely solely on the results from one intelligence test, consideration was given to treating the Wechsler-Bellevue Adult Scale (11) in the same manner as the AIT. The advantage, of course, was that the Wechsler-Bellevue Scale lent itself to the same divisions as did the AIT, that is, the verbal and performance components could be investigated separately.

The population for the study of the Wechsler - Bellevue Scale consisted likewise of men coming through the Counseling Center. Subjects tested on the Wechsler-Bellevue Scale were not tested on the AIT and, therefore, the population sampling was independnt from the one sampled on the AIT. The computed results for 94 cases revealed the same relationship to vocational interests as was noted in the study of the AIT. The statistical results are presented in table III.

TABLE III

Correlations Between Wechsler-Bellevue Verbal and Performance Scores and Kuder Mechanical and Literary Scores
(N = 94)

Correlations Between —	*r*	*P.E. (est.)*	*Level of Significance*
Wechsler-Bellevue Verbal and Kuder Mechanical	–.028	.074	None
Wechsler-Bellevue Performance and Kuder Mechanical	.310	.068	1%
Wechsler-Bellevue Verbal and Kuder Literary	.301	.068	1%
Wechsler-Bellevue Performance and Kuder Literary	.089	.073	None

An additional aspect of the investigation concerned the relation of vocational interest to special ability, where special ability is measured by the Bennett Mechanical Comprehension Test (1). Though somewhat limited in scope, sufficient data were collected to give some indication as to the relationship existing. The scores of 97 subjects on the Bennett Mechanical Comprehension test were correlated with their scores on the mechanical interest category of the Kuder Preference Record. For purposes of further verification the records of 43 other subjects on the O'Rourke Mechanical Aptitude Test (9) were analyzed. The data are presented in table IV on page 202.

Although there may be limitations in using the Bennett Mechanical Comprehension test as a measure of mechanical ability, nevertheless, recognizing its shortcomings, a correlation coefficient of .35 was computed from the scores of the 97 subjects who took both the interest and the special ability test. This coefficient was not significantly larger than that between the performance section of the AIT or Wechsler-Bellevue Scale

and the interest category of the Kuder Preference Record. It is apparent that the correlations obtained for both abilities tests were of the same order.

TABLE IV

Correlations Between the Kuder Mechanical and Bennett Mechanical Comprehension Scores, and Between the Kuder Mechanical and O'Rourke Mechanical Ability Scores

Correlation Between —	*N*	*r*	*P.E. (est.)*	*Level of Significance*
Kuder Mechanical and Bennett Mechanical Comprehension	97	.348	.059	1%
Kuder Mechanical and O'Rourke Mechanical Ability	43	.341	.093	5%

Summary

The purpose of this study was two-fold: (1) to determine the possible value of intelligence tests in vocational counseling, and (2) to explore the relationships between performance on intelligence tests and tests of vocational interest and aptitude. Tests utilized were the Kuder Preference Record, Bennett Test of Mechanical Comprehension, the O'Rourke Mechanical Aptitude Test, the Wechsler - Bellevue Adult Scale, and the Army Individual Test. The population consisted of officers and enlisted men seeking vocational and educational advice in an Air Forces Counseling Center.

Results indicated:

1. There was a positive correlation (significant at the 1% level) between the verbal component of the AIT and the literary category of the Kuder Preference Record. Similarly, there was a significant relationship between the performance component of the AIT and the mechanical interest category of the Kuder Preference Record.

2. Total intelligence test scores when correlated with vocational interest gave non-significant correlation coefficients.

3. The mechanical ability tests did not correlate significantly higher with vocational preference than did the performance parts of either the AIT or Wechsler-Bellevue Scale.

4. The Wechsler-Bellevue Scale or AIT may prove of use in vocational counseling when high verbal intelligence scores agree with strong literary or related interests, or when high performance intelligence scores agree with strong mechanical or allied interests.

REFERENCES

1. Bennett, G. K. and Fry, D. E. *Test of Mechanical Comprehension.* New York: Psychological Corporation, 1941.
2. Berdie, R. F. "Factors Associated with Vocational Interest," *Journal of Educational Psychology,* 34 (1943) 257-77.
3. Berdie, R. F. "Factors Related to Vocational Interests," *Psychological Bulletin,* 41 (1944) 137-57.
4. Carter, H. D. "Twin Similarities in Occupational Interests," *Journal of Educational Psychology,* 23 (1932) 641-55.
5. Darley, J. G. *Clinical Aspects and Interpretation of the Strong Vocational Interest Blank.* New York: Psychological Corporation, 1941.
6. Fryer, D. *The Measurement of Interests in Relation to Human Adjustment.* New York, Henry Holt and Co., Inc., 1931.
7. Guertin, Wilson H.; Frank, George H.; Rabin, Albert I. "Research with the Wechsler-Bellevue Intelligence Scale: 1950-1955," *Psychological Bulletin,* 53 (1956) 235-57.
8. Kuder, G. F. *Kuder Preference Record.* Chicago: Science Research Associates, 1942.
9. O'Rourke, L. J. *Mechanical Aptitude Test,* Form A. Washington, D.C.: The Psychological Institute, 1940.
10. Strong, E. K., Jr. *Manual for Vocational Interest Blank for Men.* Stanford, California: Stanford University Press, 1940.
11. Wechsler, David. *The Measurement of Adult Intelligence.* Baltimore: The Williams and Wilkins Co., 1944.

The Bureau of Business Research of the College of Business and Public Service of Michigan State University has recently issued *Teaching Typewriting Through Television* by William R. Pasewark as its Research Report Number 17. Dr. Pasewark undertook the research in connection with his work on his doctorate at New York University, but the investigation was carried on at Michigan State. The study consisted of setting up control and experimental groups which were taught typewriting by conventional and television methods, respectively. The achievements of these groups at the end of the experiment were then studied and compared.

The research appears to have been well done and the conclusions are not more than the data warrants. Insofar as the ability to type is concerned, teaching by television seems to be effective. The problems involved in securing teacher-student rapport were found to be significant in the case of groups taught by television. The most important things to be remembered by those reading the report are that university students were involved and that the learning was a specific skill. The study does not give much backing to those who would advocate teaching by television in elementary and secondary schools.

The sixty-six page report may be obtained for $1.50 from the Bureau of Business Research; however, checks should be made payable to Michigan State University.

An Evaluation of Achievement in Social and Family Relationships

OLIVE A. HALL

Teachers of social and family relationships have the satisfaction of contributing toward happy home and community life, yet they are confronted with a very difficult problem of evaluating the achievement of their students. Although written tests may not predict accurately how students would behave in real situations or measure adequately their understanding of how to deal with problems of human relationships their use still seems justified. Objective tests were used in this investigation to reveal the extent of students' understanding of social and family relationship problems at the beginning and end of the unit of study in a senior high school class, to compare achievement of students who had studied these problems with that of similar groups of students who had not had formal training in this area, and to identify certain characteristics that were related to the students' responses.

Background of the Study

Through interviews with eight homemaking teachers in Los Angeles County, Olevia Barker[1] derived six important objectives for courses in social and family relationships:

1. To recognize the importance of applying democratic principles in the home.

2. To develop a wholesome attitude toward and respect for marriage and family life.

[1]Olevia L. Barker, *The Construction of Objective Test Items for Evaluating Student Achievement in Social and Family Relationships at the Secondary Level*, unpublished Master's Problem, Los Angeles, University of California, 1955, pp. 28-30.

Olive A. Hall is Assistant Professor of Home Economics at the University of California at Los Angeles. She has been in this position for three years. She has been a high school teacher in New York and Connecticut and for three years served as a graduate assistant in the Evaluation Service Center at Syracuse University. She directed the Co-operative Study of Attitudes Toward Homemaking Education in California. Her doctoral degree was obtained from Syracuse University in 1951.

3. To have the ability to make more intelligent social contacts and lasting friendships.

4. To develop the ability to choose a life companion wisely.

5. To consider what it means to be ready for marriage.

6. To understand the privileges and responsibilities of marriage.

From the answers that 70 students wrote to free-response questions, two objective tests were developed around these six objectives. In the spring of 1956, one form of the test was taken as a pre-test and the other form as a post-test by 177 students who were studying Family Relations (in Homemaking courses or Senior Problems) and by 56 students who were not studying these problems. Most of the students were high school seniors. The length of time that was specifically devoted to the study of Family Relations ranged from approximately three weeks in one of the schools to eight weeks in another school. In reality, discussions related to Social and Family Relations began prior to the organized unit and extended beyond it as the teachers integrated this study into the year's program.

The Findings

The following statements summarize the findings with regard to mean scores and variability:

1. Schools that had the lowest average scores on the final test were the ones in which the intelligence quotients were low and in which the greatest amount of gain was made between the pre-test and the post-test scores.

2. The average gain in scores on the final test was greater for the Family Relations classes (1.76) than for the groups who were not studying Family Relations (1.13).

3. Differences between the mean scores of the Family Relations students in the five schools were not significant.

4. Analysis of covariance revealed a significant difference between the means of the final scores obtained by the Family Relations students and the control group, independent of the effects of the scores on the pre-test.

5. Girls had higher mean scores than did boys.

6. Engaged students had higher mean scores than did students who were single and not engaged.

7. The children of fathers employed in the professional or managerial occupations tended to score higher than did children of fathers employed in other occupations.

8. When the students were placed in three groups according to their intelligence and three groups according to their pre-test scores, the average scores on the final test showed quite a consistent trend to be higher as intelligence and pre-test scores increased, as shown in Table I.

TABLE I
Mean Scores on the Final Test Classified by Intelligence and Pre-Test Scores

Intelligence Quotient	*Family Relations Students Pre-test Scores*			*Control Group Pre-test Scores*		
	32-49	*50-58*	*59-64*	*32-49*	*50-58*	*59-64*
110 or above	53.5	57.6	58.8	[a]	55.4	59.4
90-109	51.9	56.3	53.6	51.3	53.6	65.0
89 or below	41.8	46.0	63.0	39.3	52.0	[a]

Note: This table should be read as follows: The mean final test scores of family relations students with IQ's of 110 or above, and who had pre-test scores ranging from 32-49, was 53.5, and so on.
[a] **No cases.**

Differences in pre-test responses that were related to **personal characteristics** of the students have been summarized in Table II.

One of the true-false questions, stating that family life education aims to make families conform to a normal pattern in their relationships, showed a reversal from what one would desire—it was answered correctly by a higher per cent of the students who had taken no homemaking previoulsy than by those who had studied homemaking and by a higher per cent of students with low I.Q.'s than of those with high intelligence. Other items on the pre-test confirmed the fact that teachers should clarify the goals of family life education and help the students to understand the purposes of a high school course on home and family living.

Following their study of family relations, a higher per cent of girls than of boys answered correctly questions on choosing a life companion. The only question in which boys did better than girls was one that pointed toward happiness in marriage for young people who have a smooth courtship and engagement period. The students who were not engaged were correct in recommending that an engaged girl find out about her fiance's family background and his attitudes toward children. Those who were engaged advised against living with in-laws.

Conclusions and Recommendations

Within the limits of the reliability and validity of the instruments that were used to gather data for this study and the adequacy of the sample,

TABLE II

Personal Characteristics Related to Pre-Test Item Responses

Test Item	Answered Correctly by More—					
	Girls than Boys	*Boys than Girls*	*Engaged Students than Single Students*	*Students with Previous Homemaking Study than Those Without*	*Seniors than Juniors*	*Students Living with One or No Parent than those with Both Parents*
Application of democratic principles:						
Responsibility for family food shopping	X					
Meaning of democratic home	X			X		
Sharing in decision making	X			X		X
Reasons for sharing household tasks	X			X		
Parents giving help to their married children			X			
Decisions on spending family's money					X	
Making social contacts and friendships:						
Choice of friends	X		X	X	X	X
Choice of life companion:						
Adjusting to early years of marriage	X		X			
Changing bad habits	X		X			
Personal qualities indicating success as husband or wife	X		X			
Being ready for marriage:						
Following a budget	X		X			
Privileges and responsibilities of marriage						
Selfishness and jealousy as causes of marital conflict		X				

the investigator feels that the following conclusions and recommendations might be suggested:

1. Personal factors in the background of the students contribute to their understanding of family relationship problems before they study home and family life in the junior or senior year of high school. Sex, engagement, intelligence, and previous study of homemaking seemed to be related to the differences in mean scores of the students on the pre-test used in this study. A teacher of Social and Family Relations for juniors and seniors should consider the background of the students, develop a common core of experience, and clarify for himself and the students the aims and values of a high school course on home and family living.

2. Formal training in the area of home and family life is a justifiable part of the high school curriculum as shown by the fact that students who were given this opportunity made more significant gain than did the control group of students, when the gain was considered independently of the pre-test scores. The length of time devoted to the unit of study, methods of teaching, instructional materials, personal qualities of the teacher, and other variables might be important factors to consider in organizing a family life education program, but further study would be necessary to determine the effects of such variables. In addition, further study would be desirable to reveal progress toward objectives that were not covered in this achievement test and to evaluate growth toward objectives that cannot be measured through an achievement test. Changes in attitude and behavior of the students in the home and community are desirable outcomes of family life education, but they were beyond the scope of this investigation.

3. Although the variability in scores on the final test was reduced in three of the schools where social and family relations were discussed, it was increased in the other two schools. Fewer differences between the response of boys and girls to the individual test items were noted following their study of family relations than were evident on the pre-test. From that standpoint, the recommendation might follow to include both boys and girls in family life education classes as a means of helping them to understand the functions of the home and family and to make smooth adjustments in their own courtship and marriage.

Specialists: Findings Concerning Their Employment and Ways of Working

ELEANOR CHESAREK

The Oceanside-Libby Union School District, grades kindergarten through eight, is a typical California school district as far as rapid growth is concerned. Before World War II, Oceanside was a quiet little beach town of about 5,000 people. Since World War II and the designation of nearby Camp Pendleton as a permanent military base, the town has grown to four times its former size. The school district, which had a pupil population of 625 in1940, now has one of over 3,800. As additions to the professional staff became necessary, one of the problems that arose was "what specialists shall we hire, in what order, and what types of services should they offer to the district?"

In February, 1956, a committee of citizens, teachers, administrators and specialists was formed to study the needs of the rapidly growing district. One of the results of the meetings of this committee was the preparation, by the music supervisor of the district, of a survey to determine "present and desirable uses of specialists in elementary school districts." One hundred six survey instruments were sent out—56 to California elementary districts and 50 to school districts throughout the United States. All the districts were comparable to Oceanside-Libby in size. Three-fourths of the questionaires were returned, about half of which were from California districts. As there are few unified districts in other states outside of California, unified districts encompassing grades kindergarten through twelve were asked to fill out the questionnaire only in terms of specialists hired to serve in grades kindergarten through eight.

In the survey, a *specialist* was defined as follows: "A properly credentialed person who, through special education, training, and experience, has achieved know-how in a particular educational field or service." The term *supervisor,* which was used in the survey instead of coordinator or consultant, was defined as a specialist "who works primarily with teachers in her special field." A *teacher specialist* referred to one "who works primarily with children in her special field."

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Three main questions were asked in the survey: (1) "Which and how many of the following specialists do you employ and on what bases?" Twenty-one different specialists were listed in nine different curricular areas. "Supervisory specialists" were distinguished in each area from "teacher specialists." (2) "Assuming adequate financial support, if you were free to hire any specialists you do not already have, which would you hire and in what order?" (3) "If you employ or hope to employ specialists, in which of the following ways would you prefer them to work?" Twelve different ways of working with teachers were presented.

As the tabulations of the returned questionnaires were being made, some interesting differences and similarities between the California districts reporting and the districts in the other states became evident. The most significant present trends of employment and uses of specialists as revealed by the tabulations follow. The results will be reported for the California

TABLE I
Practices of Forty California Districts in Employing Specialists for Grades K-8

Type of Specialist	*Total Employed*	
1. Instrumental Music Supervisor	6	
2. Instrumental Music Teacher	31	
3. Music Supervisor (General)	23	
4. Music Teacher (General)	22	
Total Music		82
5. Special Training Teacher (Mentally Retarded)		48
6. Physical Education Supervisor	8	
7. Physical Education Teacher	*38	
Total Physical Ed.		46
8. Guidance Director	10	
9. Guidance Counselor	5	
10. School Psychologist	12	
11. Psychometrist	6	
Total Guidance		33
12. Art Supervisor	16	
13. Art Teacher	12	
Total Art		28

* 35 in grades 7 and 8.

elementary districts reporting and the U.S.A. districts—meaning the results for the California districts as contrasted with districts (grades kindergarten through eight) in the rest of the country.

Present trends in the employment of specialists are shown in the following two tables. Only those curricular areas are shown in which the greatest number of specialists are employed.

TABLE II

Practices of Thirty-One School Districts Outside California in Employing Specialists for Grades K-8

Type of Specialist	*Total Employed*	
1. Instrumental Music Supervisor	5	
2. Instrumental Music Teacher	28	
3. Music Supervisor (General)	17	
4. Music Teacher (General)	44	
Total Music		94
5. Art Supervisor	12	
6. Art Teacher	36	
Total Art		48
7. Physical Education Supervisor	7	
8. Physical Education Teacher	35	
Total Physical Education		42
9. Special Training Teacher (Mentally Retarded)		28
10. Librarian (Department Head Status)	11	
11. Library (Individual School)	17	
Total Library		28
12. Speech Correction Supervisor	2	
13. Speech Correction Teacher	15	
Total Speech Correction		17

The foregoing tables reveal that only in the areas of music and physical education is there a similarity between the California districts and the U.S.A. districts in numbers of specialists employed. This similarity in the area of music, however, does not extend to the type of specialist employed, as it will be noted that in the U.S.A. districts music teachers far outnumber music supervisors. The area of guidance is not shown in the U.S.A. table as the number of employees in this area was too small. The total number of guidance specialists in the U.S.A. district is about one-third of the total employed in California districts. The area of library, which does not appear in the California table, would be next after art in the number of specialists employed, but, in contrast to the U.S.A. districts reporting, librarians with department head status greatly outnumber individual school librarians.

The California and U.S.A. districts reporting differ as to "reasons for hiring of specialists presently employed." "Expressed felt need of teachers" was the reason most frequently checked by the California districts, while "classroom teachers inadequately trained in proper techniques" was the reason receiving first place in the U.S.A. districts. "Budget limitations" was twelfth in frequency for the California districts, while in the U.S.A. districts it was fourth in frequency.

The California and U.S.A. districts reporting are in agreement as to the second question of the survey: "Assuming adequate financial support, if you were free to hire any speicalists you do not already have, which would you hire and in what order?" Both regard the position of school psychologist as the top need in the future employment of specialists. They also feel quite similarly about their second and third choices for future employment. In the California districts reporting, Remedial Reading Teacher, and Art Supervisor received equivalent weighted rank scores for second choice. The U.S.A. districts reporting also gave second place to Remedial Reading Teacher, along with Guidance Counselor, which received an equivalent weighted rank score. Speech Correctionist was the third choice of both the California and the U.S.A. districts.

Question three of the survey, regarding ways in which a specialist should work, revealed differences in the thinking of the California districts reporting and the U.S.A. districts. California gave first place to "workshops for teachers" while the U.S.A. districts gave first place to "combination direct work with children in the classroom and group work with teachers." The latter method was the second choice of the California districts reporting, while the U.S.A. districts gave a weak second place to "workshops for teachers," but it received less than half the weight of their first choice. Both the California districts and the U.S.A. districts gave third place to conferencing with individual teachers, but in the U.S.A. districts it received less than a third of the weight of their first choice, while in the California districts this third choice received more than half the weight of their first choice. California districts reporting gave fourth place to "resource person" as a way of working with teachers by specialists, while the U.S.A. districts did not arrive at any fourth choice.

The persons to whom the surveys were sent were asked to write comments on questions 2 and 3, if they cared to. Some of these comments follow below. Those selected either express a point of view shared by several others, or were felt by the writer to be of particular interest.

QUESTION: *"Why these specialists (future employment) and why this order?"*

California districts:

Guidance Director—**"Our needs in guidance and special education seem to be increasing rapidly."**

Librarian **(individual school)—"Better use needs to be made of our supplementary and professional books."**

School Psychologist—"For further study of more children for preventive program." "Increasing number of children with social, emotional, and physical problems."

Remedial Reading Teacher—"Classroom teacher doesn't have time to give individual remedial reading instruction"; "Desired by faculty, and tests show need."

Science Supervisor—"Could give confidence to teachers, and this field needs attention."

U.S.A. districts:

Guidance Counselor—"Guidance work is necessary earlier than is currently done in most schools."

Librarian (individual school)—"Would like to have librarian assigned to class in library which would not be used as classroom. Remedial work with small groups. Work with gifted children . . ."

Physical Education Teacher—"Need to develop more effective program."

Remedial Reading Teacher—"Many pupils need special help."

QUESTION: *"Reasons for your choices (ways of working by specialists with teachers) and selected order of choices."*

California districts:

"Teachers' comments indicate their keen interest in workshops. Principals need to have the 'know-how' if they are to help teachers. Teacher committees afford best opportunity for the teacher to express her needs and to share in planning."

"While it is difficult for a special teacher to work with all classes and classroom teachers, the majority of teachers like demonstrations in the field of music and art. They want workshops and someone to discuss methods and problems with. A psychologist and remedial reading teacher would naturally have to work with both teachers and children."

"Workshops for principals and teachers is the best technique for in-service training on a grade or group level. Workshops with principals will help the principal in his in-service training at his school. Observation of a teacher's classroom work is the best way of helping to meet the needs of teachers and children."

U.S.A. districts:

"Greatest good from any specialist would, I feel, come in his direct contact with children. If this were financially impractical, as would be the case in many schools, the greatest good would then come from his knowledge being shared by teachers, pupils, etc."

"Our greatest need is in the areas numbered 8-9-6 and 11." (Referring to, and in that order—"working directly with children"; "combination direct work with children and group work with teachers"; "conference with individual teachers"; and "conference with principals."

This article is a summary of a 26-page study including many more tables of frequencies and tables of weighted rank scores. Interested readers may obtain a copy of the complete study by writing the author.

Analysis of High School General Educational Development Test Scores

DONALD A. LETON

There are thousands of high school equivalence certificates awarded each year throughout the United States on the basis of the High School General Educational Development[1] Tests (2). The major use of these tests has been to determine whether an individual has attained an educational level which is equivalent to that required for a high school diploma. They are also used, however, in counseling students, out-of-school youth, and adults. In some situations they are used to appraise applicants for employment. In addition, they are helpful to recommend school placement for immigrants and for returning servicemen. The High School GED's, therefore, have assumed an important role in veterans' counseling and educational guidance.

In scoring and interpreting these tests at the Veterans' Testing Service for the Saint Paul, Minnesota Public Schools the following observations were made. The patterns of scores received by GED applicants were consistently different from the high school norms provided in the manual. The scores which they received on test Number 1 were consistently lower than scores for the other tests; and scores on Number 3 were consistently higher than those on the other tests in the battery.

In order to test the accuracy of these observations, statistical comparisons of the score distributions were made. The subjects for the study include all the veterans, servicemen, and civilian adults who took the tests

[1] Hereafter in this article the words General Educational Development will be referred to as GED.

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at this center, or who submitted their scores from other agencies for consideration. Between September 1953 and June 1955, there were 612 complete test records that were received or processed at this center. The sources of test scores are indicated in table I.

TABLE I
Sources of High School GED Test Scores

Source	*Number*
Number of complete High School GED Test batteries administered by this center	263
High School GED Test reports submitted from other agencies	
1. U.S.A.F.I. (administered at military installation)	285
2. Veterans Guidance Centers in Minnesota	61
3. Out-of-state agencies	3
Total	612

Twenty-three of the individuals tested at the center did not receive passing scores. This represents approximately 8 per cent of the examinees who reported for testing. The scores for 32 individuals who did not complete the battery were not included in the analysis. Thirty-five per cent (92) of the examinees at this center were women. There were no GED test reports from women in the service. The pattern of scores received by GED applicants was analyzed and compared with the norms for high school seniors. Table II presents the summary statistics necessary to test the hypotheses.

TABLE II
Summary Statistics for High School GED Test Scores

Test	*N*	*Mean*	*S.D.*
1. Effectiveness of Expression	612	45.7	9.72
2. Readings in the Social Studies	612	51.7	7.56
3. Readings in the Natural Sciences	612	54.1	7.06
4. Interpretation of Literary Materials	612	52.2	7.19
5. General Mathematical Ability	612	51.3	8.25
Total	3,060	51.0	8.46

Statistical Analysis

The null hypothesis, that there are no significant differences among GED means was tested, using the analysis of variance method. The assumption of homogeneity of variances underlying this analysis was first tested,

using Nayer's L_1 test (1). It was found that the variances are homogenous. ($L_1 = 1.218$, harmonic mean $= 611.2$, $k = 5$, and $P < .01$.) The assumption of normality of distributions was not tested.

Computations for the analysis of variance are presented in Table III.

TABLE III
Analysis of Variance Table for High School GED Test Means

Source of Variation	*d.f.*	*Sums of Squares*	*Mean Square*	*F*	*Hypothesis*
Between	4	24,205	6051.3	94.9	Rejected .01 level
Within	3055	194,597	63.7		
Total	3059	218,802			

The results of this analysis indicate that there are significant differences among the GED test means. It is concluded that the score distributions do not possess a common mean.

The significance of the differences between the extreme test means, Number 1 and Number 3, and the grand mean was then tested, utilizing Fisher's "t" test. For test 1, the mean difference was -5.3 standard score units. This difference is statistically significant ($P < .01$). The mean score for GED 1 was significantly lower than the average for the battery. For test 3 the mean difference was +3.1 standard score units. This represents a significant difference ($P < .01$) in favor of test 3 over the grand mean.

A comparison was then made of the mean scores for GED applicants with the norms for high school seniors. It was found again that significant differences existed on tests 1 and 3.

A tabulation was made of the tests which were failed. Forty-four tests were failed by the 23 individuals who did not pass the battery. The Chi Square test was used to test the hypothesis that the observed distribution of failure was in agreement with the theoretical distribution if all tests present the same level of difficulty. This analysis is shown in Table IV.

The observed distribution of test failures differs significantly from the theoretical expectation of an equal number of failures for each test.

Summary

An analysis was made of the high school GED Test scores for 612 individuals. A summary of this study follows:

1. The L_1 test for homogeneity of variances indicates that the distributions of test scores have an equal or common variance.

2. The analysis of variance test indicates that there are significant differences among the GED Test means.

3. The mean score on test 1 was significantly lower than the average for the battery.

4. The mean score on test 3 was significantly higher than the average for the battery.

5. The mean scores for 1 and 3 also differed significantly from the high school norms.

6. The observed distribution of test failure differed significantly from the theoretical distribution, if each test presents the same probability of failure.

TABLE IV
Chi Square Test on Observed and Theoretical Distributions of GED Test Failure

Test	*Failures Observed*	*Theoretical Frequency*	$(f_o - f_t)$
No. 1	16	8.8	7.2
No. 2	8	8.8	.8
No. 3	3	8.8	5.8
No. 4	5	8.8	3.8
No. 5	12	8.8	3.2
TOTAL	44	44	

Chi-Square: $= \Sigma \frac{(f_o - f_t)^2}{f_t} = 12.59$; d.f. $= 4$

Conclusion: significant at .05 level.

Conclusions and Interpretation

This study compared the educational characteristics, as measured by the High School GED's, of two test populations: (a) high school seniors as indicated by the test norms, and, (b) GED applicants served by a testing agency. The scores received by GED applicants were significantly lower in test 1, Correctness and Effectiveness of Expression, and significantly higher in test 3, Interpretation of Reading Materials in the Natural Sciences.

The findings in regard to test 1 are consistent with the general opinion that dropouts are lower in verbal skills than those who remain to graduate. The findings in regard to test 3 are not so logical, however, and require further interpretation. One possible interpretation is that the training received while in military service or from other adult expreiences led to

further achievement in the natural sciences. There is also a possibility that students who left high school before graduation possessed a greater potential for achievement in the natural sciences than was recognized while they were in school.

If the findings in this study are substantiated by further research, the consequences and implications would be important to secondary curriculum and guidance. In view of the demand for technicians and craftsmen in modern industry, counselors should perhaps consider the natural science aptitudes of potential dropouts more thoroughly. Curriculum planners might also review and expand the offerings in natural science subjects in an attempt to retain more students to graduation. Further research is recommended on the educational characteristics and achievements of high school dropouts.

REFERENCES

1. Johnson, P. O. *Statistical Methods in Research,* pp. 71-3, 82-3, 210-16. New York, Prentice-Hall, 1949.

2. United States Armed Forces Institute. *Test of General Educational Development, High School Level, Examiners Manual.* Washington, American Council on Education, 1945. 15 p.

A Handbook for Instructional Leaders on the Use of Encyclopedias in Schools is the title of a thirty-two page pamphlet issued by the College of Education of the University of Washington. The handbook is intended as a resource item for teacher-education institutions, library schools, and school administrators. It includes criteria for evaluating reference materials and for determining a school's need for such materials, suggestions for acquainting teachers with the content and uses of reference sets, and other specific and practical suggestions based on two weeks of discussion among a group of administrators, teachers, librarians, and publishing company consultants.

Single copies of this publication may be obtained without cost from the College of Education, University of Washington, Seattle 5, Washington.

Shorthand Study and Spelling Abilities—A Replication

JUNNE W. JENSEN and BARRY T. JENSEN

"I was a good speller until I studied shorthand," many students say. The writers previously reported a study of transfer effect of the study of shorthand as it might affect spelling abilities (2). It was stated in summary that ". . . the study of shorthand does not necessarily have a negative effect upon either of the spelling abilities." It was also reported that at least two somewhat different spelling abilities can be identified. The present study was a repetition of the earlier one, with certain modifications to improve the adequacy of the measures.*

Population and Procedures

In both studies the experimental subjects were eleventh-grade pupils enrolled in beginning Shorthand and in a required class in English. The control subjects were enrolled in the same English classes but not in a Shorthand class. The earlier study was conducted in Bladensburg High School, Maryland; the present study, in Fremont High School, Sunnyvale, California. Each school, located in a suburban area and offering work in a broad range of fields, enrolled about 1500 pupils. In both studies potential subjects were eliminated if they did not complete the series of pre- and post-tests. The California group was smaller because fewer students enrolled in Shorthand—all available Shorthand classes being included. Control and experimental groups were not matched on the basis of any intelligence measure because findings of the earlier study indicated a negligible relationship between intelligence and gain in spelling ability. Data from the present study support the decision not to match the groups.

* **The work reported here was done apart from the employment of the writers and the opinions expressed herein are not necessarily those of either organization nor of any other employees.**

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Junne W. Jensen has been a high school teacher in Maryland and in California. She is currently employed by the Santa Monica Unified School District. This article is a digest of her master's thesis, which was completed at San Jose State College in 1957.

Shorthand students in the school (meeting the criterion of enrollment in English) and students in available English courses took the same spelling tests near the beginning of the school year and again near the end of the year; about eight months of study intervened. The number of English classes tested was determined by the number of Shorthand students—an effort being made to get the groups about equal in size. Analysis of the data was the same in both studies: change in test scores in the total group of Shorthand students as compared to change in the control group.

The Tests

The major difference in the two studies concerns the tests used. In both cases students completed two forms of spelling test: multiple-choice (Test M) and recall (Test R). Methods of administration were the same. However, it was felt that the earlier tests were too easy; for instance, on Test M the pre-test mean for the experimental group was 41.76 of a possible 48 points. Since an initial score of this altitude seriously limits the amount of gain possible, an effort was made to make the tests more difficult. The new tests were constructed in the manner described in the next paragraph.

A recall test (same format as Test R) of 150 spelling "demons" was compiled from various sources and administered to Senior students in a high school in which the school median on standardized achievement tests is typically at the national 90th percentile. The fifty most frequently-missed words were used in making the tests for the experiment. In the earlier study Tests M and R were composed of different words; in the latter (California) study, the same words. Reasons for this latter condition included the wish to use only "difficult" words and the desire to gain further evidence regarding the existence of at least two spelling abilities. (If the tests have low correlations using the same words, then we can be more certain of the adequacy of the conclusion.) That the new tests were, in fact, more difficult than the old ones was shown by the lower scores—the pre-test mean for the experimental group, for instance, was 8.70 points lower in spite of the possible score being two points greater. Reliability of both sets of tests was comparable, as can be seen in Table I.

In the latter study, California Test of Mental Maturity scores were obtained from the school records for those students for which available. These were used in checking the relationships between "intelligence" and gain in spelling abilities.

Results

Entries 1 and 2 in Table I present data regarding the reliability of the tests. For Test M the coefficient of reliability (split-half corrected) was just a few points greater than in the earlier study; for Test R the coefficient was a few points lower but in both instances the difference was negligible.

Other entries in Table I contain data relative to the kinds of spelling abilities tested. It can be seen that as the number of "identical elements" between tests increased, so did the coefficient of correlation.

TABLE I
Coefficients of Correlation Among Spelling Tests of Various Degrees of Similarity
(N = 60)

Test	*Characteristics*	*r*
1) R_1 vs. R_2*	Same words, same format (split-half, corrected by Spearman-Brown formula)	.87
2) M_1 vs. M_2	Same words, same format (split-half, corrected by Spearman-Brown formula)	.87
3) M vs. R	Same words, different format	.78
4) R_1 vs. R_2	Different words, same format (Recall)	.77
5) M_1 vs. M_2	Different words, same format (Multiple-choice)	.76
6) M vs. R**	Different words, different formats	.66
7) M_1 vs. R_2	Different words, different formats	.63

* Sub-scripts refer to odd or even items on Test (Recall) or Test M (Multiple-choice).

** Data from earlier study, N equals 165.

Table II contains data indicating that the experimental (Shorthand) group made statistically significant gains on both tests from the beginning

TABLE II
Means, Sigmas, and Differences Relating to Two Spelling Tests Administered to Shorthand Students and Non-Shorthand Students

Test	*Number*	*Group**	*Mean*	*SD*	*Diff*	*P*
M, Pre-test	32	S	33.06	10.4	4.91	.01
M, Post-test	32	S	37.97	8.5		
R, Pre-test	32	S	27.87	10.0	4.79	.05
R, Post-test	32	S	32.66	9.4		
M, mean gain	32	S	4.91	4.9	2.80	.05
M, mean gain	28	N	2.11	4.8		
R, mean gain	32	S	4.79	4.2	.90	Not Sig.
R, mean gain	28	N	3.89	5.7		

* S = Shorthand students; N = Non-shorthand students.

to the end of the first year of instruction. The control group also had larger scores on the post-test; the difference in gains made by the two groups was not statistically significant at the five per cent level with respect to Test R.

It was noted that in this group the coefficient of correlation between CTMM score and gain in score on Test M was .11 (using all sixty persons in the study). The coefficient between CTMM and gain on Test R was –.37, significant beyond the one per cent level.

Discussion

In neither study did we find a statistically significant difference between the two groups in terms of gain on Test R (recall). The finding is consistent with that made by Hastings in a somewhat similar study of fifteen years ago (1). In regard to Test M, there was no statistically significant difference in gain made by the two groups in the earlier study which had the larger N, but there was a difference significant at the five per cent level in the latter study. Since this level of significance was obtained in only one of four comparisons and is at variance with data of Hastings' study, the writers accept the null hypothesis and conclude that the study of Shorthand has no necessary effect on spelling ability. These studies were stimulated by the contention that there is a negative effect; it could be positive in regard to multiple-choice test performance, but the limit on gain imposed by the earlier test may have made it impossible for this relationship to be observed.

No effort was made to control the amount of spelling instruction, although the participating teachers were asked not to alter the content of their courses during the years these studies were run. If the Shorthand teacher in the California group had usually made a special effort in regard to spelling instruction it could account for the fact that the experimental students showed greater gain. Jensen and Insel reported that any of three kinds of spelling activity (including the "negative" approach of multiple-choice tests) led to increased performance on a recall spelling test (3). Another study of transfer of effect might yield different results if specialized lists were used, *e.g.*, if the Shorthand students were tested on Business terms, the Physics students tested on Science terms, etc.

We find no reason to change the conclusion from the earlier study relative to identification of at least two kinds of spelling abilities.[1] In the previous study the coefficient of correlation between the two forms, using different words, was .66; in the present study, .63 (using a test of only 25 words). The coefficient is significantly less than the coefficient of reliability for either test—beyond the five per cent level. The total of the data in

[1] **The phrase "two kinds of spelling abilities" does not necessarily imply factors in the sense of primary mental abilities. We mean that the recognition and recall tasks in spelling are sufficiently different that performance on one is not highly predictive of performance on the other.**

Table I are consistent with what could be predicted from information about transfer—increasing similarity tends to accompany greater transfer.

In the report of the earlier study it was stated that ". . . the small gains in spelling ability are unrelated to mental ability." We see no reason to change this tentative conclusion on the basis of the present data. In the earlier study coefficients were negligible for both Test M (0.3) and Test R (.01). In the present study the coefficients were .11 and –.37, respectively. The latter one was statistically significant; however, since this finding is at variance not only with that for the other three tests but contrary to what is expected from knowledge about intellectual activity, and since tests are less than perfectly reliable, this low but statistically significant coefficient is regarded as a chance occurrence.

Conclusion

An earlier study of the effect on spelling ability was replicated in all essential respects, although the tests in the latter experiment were more difficult. Shorthand students studying eleventh-grade English were given pre- and post-measures of two kinds of spelling tasks. The changes in mean scores during the first year of study of Shorthand were compared with changes shown by non-Shorthand students enrolled in similar English classes and who took the same pre- and post-tests. It is concluded that study of Shorthand has no necessary negative effect upon spelling. It appears that there are at least two kinds of spelling ability and that intelligence has not been demonstrated to be related to gain in spelling skill.

It is recommended that Shorthand teachers instruct their students as to relationships between Shorthand and spelling. In spite of the fact that negative effects were long ago discounted (5, 6), students still have the feeling expressed in a comment the second writer overheard his secretary make to another on the day this article was drafted: "I used to spell very well, but then I took Shorthand."

REFERENCES

1. Hastings, G. A. *A Study of the Effect of Shorthand on Spelling.* Unpublished Master's thesis, Washington University (St. Louis), 1942. 58 pp.
2. Jensen, B. T. and Jensen, J. W. "Shorthand Study and Spelling Abilities," *Journal of Educational Psychology,* XLVI (February, 1955), 112-16.
3. Jensen, B. T. and Insel, S. A. "Transfer Effects in Spelling," *California Journal of Educational Research,* VI (November, 1955), 219-23.
4. Jensen, J. W. *An Investigation of the Effect of the Study of Shorthand on Spelling.* Unpublished Master's thesis, San Jose State College, 1957. 61 pp.
5. Leslie, L. A. "Shorthand and Spelling," *Business Education World,* XXIII (1943), 610.
6. Mursell, J. L. "Downing a Bogey," *Business Education World,* XXII (1941), 197-200.

DOCTORAL DISSERTATIONS IN EDUCATION

Accepted by California Colleges and Universities, 1956-1957

This classified report of doctoral dissertations in education accepted by California colleges and universities in 1956-57 represents these six institutions: Claremont Graduate School, College of the Pacific, Stanford University, University of California at Berkeley, University of California at Los Angeles, and University of Southern California.

Each study has been classified according to the scheme below under the division where the primary subject matter appeared to fit. There are numerous cross references, most of the dissertations being cross-referenced one or more times. Readers should take note of the whole classification scheme before searching for particular subjects since this scheme differs from those employed in most college and university libraries.

Many of these dissertations may be borrowed from the library of the college or university by means of inter-library loan through an established library (school system, college or university, city, county, or state). However, some institutions are now making dissertations available only through microfilm copy.

CLASSIFICATION SCHEME

THEORY
Educational Philosophy, Principles and Trends
Historical and Comparative Education

ADMINISTRATION
Organization
Finance
Buildings, Equipment, Transportation
Personnel Practices and Teacher Status
School and Community Relations
Legislation, Law

RELATED SCIENCES
Educational Psychology
Educational Sociology
Growth and Development
Measurement and Evaluation

TEACHER EDUCATION AND PROFESSIONAL STANDARDS

CURRICULUM AND METHODS
Curriculum and Extra Curricular Activities, Extended Services
Subject Matter Studies
Art and Music
Business Education
Health and Safety
Language Arts
Mathematics and Science
Physical Education
Social Studies
Other Subject Matter
Teaching Methods and Aids

GUIDANCE AND COUNSELING
Guidance and Counseling
Reporting Pupil Progress

ELEMENTARY EDUCATION

SECONDARY EDUCATION

HIGHER EDUCATION

EXCEPTIONAL CHILDREN

VOCATIONAL AND INDUSTRIAL EDUCATION

ADULT EDUCATION

OTHER

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2. Jones, Harry Earl. *Some Aspects of an Occupational Stereotype: The American Public School Teacher.* Claremont.
3. Moore, Donald Edwin. *The Educational Philosophy of Juan Mantovani.* U.C.L.A.
4. Rosenoff, Wayne E. *An Analysis of Time Perspective Theories as They Relate to Educational Planning.* U.C.L.A.
5. Wilton, M. Wilton. *A Comparative Analysis of Theories Related to Moral and Spiritual Values in Physical Education.* U.C.L.A.

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6. Al-Hassun, Abdur-Rahman. *The Social Studies Programs in the Iraqui Public Secondary Schools.* Stanford.
7. Diederich, Alphonsus F. *A History of Accreditation, Certification and Teacher Training in Catholic Institutions of Higher Learning in California.* U.C.L.A.
8. Granstaff, Viola. *Harr Wagner, California Educational Publicist.* U.C.L.A.
9. Hedges, Jack Rupert. *A History of the California State Curriculum Commission.* U.C.L.A.
10. Hill, Wayne Orlando. *American Values and "Progressive" Curriculum Writers.* Stanford.
11. Lee, William Cheng Chian. *The Opinions of American Professional Educators About Chinese Education from 1895 to 1945.* U.C.L.A.
12. Luce, Lawrence W. *A History of Industrial Arts Education in the San Diego City Schools.* U.C.L.A.
13. Maher, Rev. James F. *The Most Reverend James T. O'Dowd, D.D., Catholic School Administrator.* Stanford.
14. McLean, William Travis. *A History of Citizenship Education in Oregon's Public Schools.* Stanford.
15. Reed, Marian Elizabeth. *The History of the Psychological Foundations of Teacher Education.* Stanford.
16. Reichert, Stephen B., Jr. *The Four-Year Junior College Movement in California.* U.C.L.A.
17. Rosenhain, Geoffrey. *A Co-operative Australian-American Denominational Teacher-Education Program.* U.C.L.A.

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18. Gardiner, John Simeon. *Internal Administrative Organization of Medium-Sized Four-Year High Schools.* U.S.C.
19. Jackson, Lowell D. *An Analysis of the Problems of Small, Rapidly Growing Elementary School Districts in California.* U.S.C.
20. Jacobsen, Gene S. *School District Reorganization in Selected Counties in Southeastern Idaho.* U.C.B.
21. Merrihew, James L. *A Critical Study of Selected School Surveys in Southern California.* U.C.L.A.
22. Weekes, George E., Jr. *The proposal for School District Organization of Lake County, California.* Stanford.

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24. Wallace, Charles Edgar. *An Appraisal of the Use of Student Body Funds in Senior High Schools.* U.S.C.
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27. Deniston, Ross Carroll. *Planning Art Facilities for Secondary Schools.* Stanford.
28. Jordan, Wayne Noll. *Planning Music Facilities for the Secondary Schools.* Stanford.
29. Kermoian, Samuel Burchell. *Urban Community Maturation and School Plant Planning.* Stanford.
30. Salmon, Paul Blair. *Fire Insurance Principles and Practices in School Districts Employing Nationally Affiliated Business Officials.* U.S.C.
31. Saratt, Norman Harris. *Pupil Transportation in Santa Clara County Public Schools.* Stanford.

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33. Dusel, William John. *Professional Responsibilities of English Teachers and Conditions of Instruction in California Secondary Schools.* Stanford.

34. Ferguson, Ruby Alta. *The Role of California Teachers in Teacher Salary Adjustment.* Stanford.

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37. Osborn, Merton Bidwell. *The Qualifications, Responsibilities, and Activities of People Who Direct the Elementary Curriculum in California Public Schools.* U.S.C.

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45. Butler, John Joseph. *Differential Factors in the Self-Concepts of Over-Achieving, Under-Achieving, and Expected-Achieving Adolescents.* U.S.C.
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101. Nixon, Clifford Lee. *Neglected Problems in High School Counseling.* U.C.B.

102. Palmer, John Thomas. *A Comparison and Empirical Analysis of the Attitudes of Certain Student Groups on Selected Issues Related to University Life.* U.S.C.

103. Prochaska, Lorine. *An Investigation of Group Process and Students' Evaluations as Tools for Guidance in Physical Education.* U.C.L.A.

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110. Buchanan, Floyd. *A Study of Methods Used to Evaluate the Elementary Curriculum.* U.C.B.

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113. Baker, William Pitt. *A High School Program Evaluation by Means of a Cooperative Follow-Up Study.* Stanford.

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118. Lessinger, Leon N. *An Evaluation of an Enriched Program in Teaching Geometry to Gifted Students.* U.C.L.A.

119. Preston, Eleanora Marie. *A Comparative Study of Programs for the Education of the Severely Mentally Retarded as Compared with Opinions of What Teachers in These Programs Think They Should Be.* U.C.L.A.

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123. Sutherland, Jack West. *The Educational Ideas of Minor Political Parties.* Stanford.

Book Reviews

EDUCATING GIFTED CHILDREN

ROBERT F. DE HAAN and ROBERT J. HAVIGHURST

Chicago: The University of Chicago Press, 1957. 276 pages. $5.00.

The authors consider the distinction between ordinary gifted children and "first-order" or extremely gifted children to be very important. The ordinary or "second-order" gifted children constitute the upper 10 per cent in any particular ability; the first-order children constitute only the top 0.1 per cent. This extremely gifted group consists of individuals who are so very different from the average in ability that they cannot be expected to be well-balanced personalities in the usual sense. There is no possibility that their physical or social superiority can be of the same order as their mental superiority. Thus extremely gifted children constitute a special problem, usually met with only once or twice in an entire teaching career. These first-order gifted individuals must be treated as special cases. No general rule can be laid down except that of flexibility—a rigid school program is bound to be unsuitable to them.

All except the last chapter of the book are devoted to ordinary, or second-order, gifted children. These children do tend to be balanced personalities on an accelerated plane. They are really just ordinary children who happen to be at the upper end of the normal curve of distribution of abilities. They need the same care in their education as do average children. Motivation, wise choice of learning experiences, social adjustment, emotional health, are areas which need as much attention in their case as in the case of any other pupils. They will not succeed "in spite of the school," unless success is measured by a very low standard.

In fact, the authors emphasize that American society contains elements which tend to hinder the development of superior children, at least relatively.

In the opinion of the authors, "Many Americans . . . would discourage the development of special gifts in children and would instead encourage the development of 'well-rounded,' 'well-adjusted' persons." To the authors it is important that equality in education be equated with equality of opportunity rather than with identity of treatment.

One of the more interesting chapters in the book is that dealing with the administrative aspects of educating gifted children. Considerable attention is given to the types of persons needed for success in a program of gifted-child education. In particular, the weaknesses of certain kinds of principals and teachers are very realistically described. The pitfall of taking what is already being done on a casual basis and calling it a program is clearly discussed. So is the trick of producing an elaborate organizational chart for publicity purposes and then pretending that this paper's program is real.

The authors do not stop with debunking current attempts to jump on the gifted-child bandwagon. They go on to describe realistic programs for increasing the educational opportunities of superior students. It is true that many of the things they say are not new; it is also true that many of them will work only under special conditions. But it is also true that most teachers and administrators working under reasonable conditions will find some useful suggestions.

This volume seems to be one of the most practical and complete books of the current crop on gifted-child education. For those faced with responsibility for such education, it is well worth a place in the personal professional library. There is no question but that it belongs in all district professional libraries.

NONPARAMETRIC STATISTICS FOR THE BEHAVIORAL SCIENCES

SIDNEY SIEGEL

New York: McGraw-Hill Book Co., Inc., 1956. 312 pages. $6.50.

This book is a straightforward treatise on the testing of hypotheses in fields that do not usually offer opportunities for a very high order of measurement. Unfortunately the types of statistical analysis most familiar to the ordinary student of education, psychology, or sociology are only valid if certain very restrictive conditions concerning the nature of the population being studied and the quality of the measurements used, can be justified. Often they cannot, so that much of what passes for research is open to very serious objection insofar as the mathematical treatment of data is concerned.

The author does not spend his time saying what is wrong with research in the behavioral sciences, however. Instead, he is concerned with the presentation of the mathematical nature and limitations of certain statistical procedures. If these force one to the conclusion that much present research is conducted in such a way that the conclusions based on statisical treatment

of data are invalid, that is not the fault of the book; nor does the author dwell upon this possibility.

The book is well organized. After a brief review of the nature of statistical tests of hypotheses and of measurement, procedures for choosing appropriate statistical tests are described. The remainder of the book is devoted to a practical presentation of the possible tests of a nonparametric nature. The steps to be followed in using each test are carefully described in terms of actual or fictitious data similar to that encountered by most researchers in the behavioral sciences. The virtures of alternative tests and limitations of the conclusions that can be drawn are all clearly set forth.

The book is very well written. Nevertheless, the author's assumption that his explanations can be understood by those who have had algebra and an introductory course in statistics, is probably not justified. It is undoubtedly true that no further factual knowledge of mathemaics is needed; but experience would indicate that a book requiring an appreciation of the logic of mathematical processes is rarely comprehended by those without a strong background in the field. Lacking this background, most students of behavioral sciences tend to have an emotional reaction to mathematical discussions which prevents their applying common sense in studying the material presented. For this reason, there is considerable likelihood that this book will not have the wide use that its excellence should entitle it to.

On the other hand, the serious student of the behavioral sciences will find this an excellent handbook for use in applying statistical procedures to the data with which he works. It should be used in the planning stages as well as in the actual processing of information. The fifty-five pages of tables in the Appendix add greatly to its usefulness; and will, in fact, make the use of any other book unnecessary in many cases.

Oh, yes—on page 31 the author states, "A nonparametric statistical test is a test whose model does not specify conditions about the parameters of the population from which the sample was drawn. Certain assumptions are associated with most nonparametric statistical tests, *i.e.*, that the observations are independent and that the variable under study has underlying continuity, but these assumptions are fewer and much weaker than those associated with parametric tests."

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National Society for the Study of Education, Fifty-Sixth Yearbook, *In-Service Education for Teachers, Supervisors and Administrators*, University of Chicago Press, 143.

Siegel, Sidney, *Nonparametric Statistics for the Behavioral Sciences*, McGraw-Hill,

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